Data Call/Notes for the 2010 CMRR Supplement Analysis
Prepared by S. Hartnett, CMRR Safety/Health

8/31/2010

Objective – Develop estimates of the natural gas use by RLUOB and NF

Info Sources:

a) Email from Jeff Fauble, CMRR, 8/31/2010.
b) TA 55-FDD-400/440, RO (RLUOB Facility Design Description), June 27, 2008

See attached

NATURAL GAS USE during Operations

CMRR EIS 2003 Data

Facility use	Million cu ft per yr	not available

Source:
2003 CMRR EIS Table 2-2 ; Table 4-8

Current Estimates- July 2010

	Million Cu ft per yr	
NF	20	Email from Jeff Fauble, 8/31/2010 with reference to Process Flow Diagram M-6110 and M611A
RLUOB	31	Email from Jeff Fauble; 8/31/2010 with reference to 100925-MCAL-11.10
RLUOB Hot Water Load	7.12	Email from Jeff Fauble; 8/31/2010 with reference to 100925-MCAL-11.10
Total	58.12	

(Note no natural gas use during construction is planned)

From: Nicole Seguin
To: "Hartnett, Suzanne L"
Subject: FW: Energy usage for NF
Date: Tuesday, August 31, 2010 3:19:34 PM

FYI.

Jeff does has the info to back this up further. We'll get from him later.

From: Jeff Fauble [mailto:jfauble@lanl.gov]
Sent: Tuesday, August 31, 2010 3:11 PM
To: 'Nicole Seguin'
Cc: Onofre A. Favis
Subject: Energy usage for NF

Nicole,
I have some fairly decent numbers for you for the energy usage from the hot water system (which is therefore the energy from natural gas).

The following are operating values, these are not average values:
The NF operating usage is 7,350,000 BTU per hour (which converts to 7,350 cubic feet per hour of natural gas). Source: Process Flow Diagram M-6110 and M-6110A.
The RLUOB Building Load is 11,460,000 BTU per hour (which converts to 11,460 cubic feet per hour of natural gas). Source: 100925-MCAL-11.10.
The RLUOB Hot Water Load is 813,000 BTU per hour (which converts to 813 cubic feet per hour of natural gas). Source: 100925-MCAL-11.10.

These values are converted to yearly usages using an annual degree-day method:
The NF yearly natural gas estimated usage is 20,000,000 cubic feet of natural gas.
The RLUOB Building yearly natural gas estimated usage is 31,000,000 cubic feet of natural gas.
The RLUOB yearly natural gas estimated usage for Hot Water Load 7,121,000 cubic feet of natural gas.

Call me if you want to know how we got to these yearly usage numbers.

Jeff Fauble, PE
Lead Mechanical Engineer
CMRR Project, LANL
505-665-0595

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Los Alamos NATIONAL LABORATORY EST. 1943

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Supersedes: Not Applicable

Title: Radiological Laboratory, Utility, Office Building (RLUOB), TA-55 Buildings 400/440, **Facility Design Description**

Status: ☒ **New** ☐ Major revision ☐ Minor revision ☐ Reviewed - no change

	Name	Organization	Date	Signature
Responsible Engineer:	Catherine Flavin	CMRR-DO	6/26/08	Catherine Flavin
Responsible Manager:	Rick Holmes	CMRR-DO	6/27/08	

Reviewed Classification / UCNI

(Reviewed By)	(Z#)	(Review Date)	(Classification)
A. Padilla	117356	6-6-08	Unclassified

3.3.3 Normal Mode

The facility is expected to operate in normal mode 96% of the time. This level of availability was specified in the design basis documents and has been validated in the Reliability, Availability, Maintainability, Inspectability (RAMI) Analysis. Maintenance, surveillance, and repair activities will be conducted on redundant equipment and SSCs that do not impact the approved operating envelope and security basis of the facility (reference document(s) to be developed; see the RLUOB Preliminary Hazards Analysis (LA-CP-04-0874) and the RLUOB Safeguards and Security Plan (CMRR-PLAN-1911) in development).

3.3.3.1 Central Utility Building

Table 3-2 lists the utilities supplied from the CUB during normal operation.

Table 3-2. Utilities Supplied from the Central Utility Building during Normal Operation

Utility	Total Supply	RLUOB Supply	NF Supply	Notes
Electrical Power Substation	Substation "A" MV 13.2 kV, 3 phase, LV 480Y/277V 2500/3750 kVA(AA/FA)	Supplies Central Utility Building only; does not supply power to the RLOB.	NA	Supplies power to all loads in CUB and no other. Secondary selective unit substation configuration.
Electrical Power Diesel Generators	3 generators each at 1500 kW nameplate	4500 kW nameplate	NA	Used on loss of offsite power only – In N+1 configuration
Uninterrupted Power Supply (UPS)	NA	NA	NA	No UPS elements installed in the CUB
Potable Cold Water	0 to 240 gpm	0 to 175 gpm	0 to 130 gpm	
Non-Potable Cold Water	0 to 350 gpm	0 to 240 gpm	0 to 110 gpm	
De-ionized Water	7 gpm	6 gpm	6 gpm	1 MΩ output, 500 gallon storage tank on recirculating loop
Heating Water – Primary Loop	2805 gpm @ 180°F 26,809 MBH	NA	NA	Recirculating loop; feeds secondary loop only
Heating Water – Secondary Loop	NA	400 to 1340 gpm 13,409 MBH	13,400 MBH @ 160°F return, 55 psid 400 to1400 gpm	180°F supply, 160°F return
Chilled Water – Primary Loop	3900 gpm @ 45 psi and 40°F 12,690 MBH	NA	NA	Recirculating loop; feeds secondary loop only
Chilled Water – Secondary Loop	3900 gpm @ 40 psi	1581 gpm @ 40 psi 9000 MBH 750 tons	1440 gpm @ 40 psi 7920 MBH 600 tons	45°F supply
Ice Storage	1160 gpm @ 24°F 4230 MBH	NA	NA	Used for thermal swing and peaking
Compressed Air	0 to 395 ACFM @ 175 psig	150 ACFM @ 175 psig	235 ACFM @ 175 psig	10 ACFM @ 100 psig to CUB
Natural Gas	0 – 11 MCF per hour @ 2 psig	NA	NA	Used in CUB only

The Entry Control Facility and security room (in conjunction with the Facility Incident Command center) have dedicated HVAC, lighting, and power to allow continued operations as a stand-alone entity during off-normal conditions. This area also has public address system, telecommunications, and radio systems.

5.6.1.3 Emergency Personnel Accountability System (SDD 1.03 – REPAS)

The RLUOB emergency personnel accountability system provides personnel accountability, by location, within 45 minutes of an emergency evacuation.

The personnel accountability system (PAS) consists of a remote access panel (RAP) located at the muster area(s) to account for all people in the facility and provide a report after an emergency evacuation to determine whether all personnel have properly left the facility.

5.6.2 Water Systems

5.6.2.1 Heating Water System (SDD 1.04 – RHW)

The RLUOB heating water system generates and delivers central circulating hot water of sufficient temperature, quality, capacity and reliability to support facility ventilation and potable and industrial water heating demands for the RLUOB and the future NF.

The central heat-generating plant provides heating water to the CMRR facilities' HVAC systems and the potable and non-potable hot water systems. The boiler type was selected for energy efficient operation at the site elevation and provides capacity to satisfy the heating water and potable and non-potable hot water demands for the CMRR facilities.

The heating water system boilers and pumps operate automatically, controlled by the facility management system (FMS) and the original equipment manufacturer control panels, to meet the heating water demands of the supplied HVAC and plumbing systems.

The boiler plant uses a primary/secondary pumping configuration. The primary portion of the system is comprised of boilers and end suction pumps. Each boiler has a dedicated pump sized to the boiler performance. The boiler plant consists of three boilers and space for a fourth boiler to be installed in the future. The heating water system is sized to accommodate the RLUOB, the future NF, and 30% expansion. The energy source for the boilers is the site natural gas distribution system. Forty percent of the installed boiler capacity is dual-fuel capable: natural gas and No. 2 fuel oil. The fuel oil storage capacity is 30,000 gallons. The secondary portion of the system consists of two pumps each sized at 50% of full capacity of the RLUOB, a standby pump, and space for two pumps to be installed in the future. The secondary heating water supply temperature is 180°F and return temperature is 160°F. The hot water supply temperature will be reset based on building heating demand.

The laboratory reheat water portion of the heating water system supplies the reheat coils in the laboratory area with heating water. This portion of the system is physically separated from the remainder of the heating water system by a plate and frame heat exchanger. This separation was designed to protect the Hot Water and Secondary Heating Water from possible contamination by the laboratory. The laboratory reheat portion of the system consists of one plate and frame heat